



**WORKING PAPER**

**THIRTEENTH AIR NAVIGATION CONFERENCE**

**Montréal, Canada, 9 to 19 October 2018**

**COMMITTEE A**

**Agenda Item 1: Air navigation global strategy**

**1.3: Air navigation roadmaps**

**GLOBAL INTEROPERABILITY**

(Presented by the Civil Air Navigation Services Organisation (CANSO))

**EXECUTIVE SUMMARY**

Ever-increasing automation in air traffic management (ATM) poses new challenges for global standardisation and harmonisation. To exploit the advantages of automation and facilitate the Civil Air Navigation Services Organisation's (CANSO) vision of a globally harmonised, interoperable, and efficient air navigation system, CANSO strongly encourages closer coordination between standards organisations and mutual recognition of conformity assessment results.

CANSO suggests that ICAO strengthens and better defines the provisions in ICAO Assembly Resolution A39-22 sub section 5, to enhance global coordination and harmonisation as outlined in this paper.

**Action:** The Conference is invited to agree to the recommendations in paragraph 5.1.

**1. CURRENT SITUATION**

1.1 Several air traffic management (ATM) research programmes, for example NextGen, SESAR, and CARATS, are working on the development of new ATM technologies. To industrialise such new technologies, detailed technical specifications are needed. Today, most technical ATM systems use proprietary interfaces and data formats.

1.2 The development of detailed technical specifications (standards) to be implemented by regulatory authorities and industry is predominantly carried out by aeronautical standards organisations with regional applicability and limited representation of international stakeholders.

**2. NEED FOR GLOBAL HARMONISATION AND STANDARDISATION**

2.1 As the research into new ATM technologies is progressing, it is clear that to establish the required interoperable global data environment, detailed technical specifications must be harmonised globally in a prompt and timely manner. Only such a highly interoperable global data environment will support operational concepts, which require a high degree of safe and reliable system-to-system

interactions. Such use cases are, for example, trajectory-based operations (TBO), system-wide information management (SWIM), and the safe integration of remotely piloted aircraft systems (RPAS) and unmanned aerial systems (UAS).

2.2 It is essential that ICAO strengthens its provisions for developing detailed technical specifications (Standards) and conformity assessment procedures to facilitate an interoperable data environment. It is of utmost importance for the consistency of the global transportation system to achieve interoperability between the different technical solutions that are being developed. Generic global specifications must be leveraged to the greatest extent possible to increase efficiency, save costs and shorten development times. Interoperability between such industry specifications is not always guaranteed. For example, in the area of electronic obstacle data various detailed technical specifications to collect, promulgate and process such information have been developed independently from each other with either no or limited interoperability between such specifications. Avionics specifications developed by ARINC (813, 814, 815) are not compatible with Aeronautical information exchange model (AIXM) specifications (EUROCONTROL and the Federal Aviation Administration (FAA)) used to promulgate such data between ground systems.

2.3 By complying with the basic principles as contained in the “Code of Good Practice for the Preparation, Adoption and Application of Standards”, interoperability will become a pre-condition for the development of detailed technical specifications by the various organisations. It is ICAO’s role to oversee/support coordination between various organisations developing detailed technical specifications with the view to enhance interoperability

2.4 ICAO has addressed the standardisation and harmonisation of technologies and procedures within its Member States since its inception. The *Convention on International Civil Aviation* (Chicago Convention, Doc 7300) states:

***“Article 37***

*Adoption of international standards and procedures*

*Each contracting State undertakes to collaborate in securing the highest practicable degree of uniformity in regulations, standards, procedures, and organization in relation to aircraft, personnel, airways and auxiliary services in all matters in which such uniformity will facilitate and improve air navigation. [...]*”

2.5 ICAO Assembly Resolution A39-22: “Formulation and implementation of Standards and Recommended Practices (SARPs) and Procedures for Air Navigation Services (PANS) and notification of differences” further elaborates the provisions set out in the Chicago Convention:

*“5. Instructs the Council to utilize, to the maximum extent appropriate and subject to the adequacy of a verification and validation process, the work of other recognized standards making organizations in the development of SARPs, PANS and ICAO technical guidance material. Material developed by these other standards-making organizations may be deemed appropriate by the Council as meeting ICAO requirements; in this case such material should be referenced in ICAO documentation;”*

2.6 In the light of ever-increasing automation requirements, the current ICAO provisions need to be substantially strengthened to ensure the required level of interoperability in the global aviation system. The criteria for material developed by other standards-making organisations to be accepted by ICAO need to be better defined and implemented by the appropriate authority.

2.7 International best practice for the development, adoption, and maintenance of detailed technical specifications is the World Trade Organization's (WTO) "Code of Good Practice for the Preparation, Adoption and Application of Standards"<sup>1</sup>. The new ICAO provisions to be developed would ensure that all detailed technical specifications referenced by ICAO meet the criteria set forth in the WTO Code of Good Practice for the Preparation, Adoption and Application of Standards. Its adoption is open to any standardising body<sup>2</sup>.

2.8 To ensure maximum interoperability between States' implementations, ICAO required the use of test systems and compliance testing in the guidelines for the implementation of operational meteorological (OPMET) Data Exchange using the ICAO meteorological information exchange model (IWXXM)<sup>3</sup>:

*“4.1.6 Compliance Testing*

*IWXXM compliance testing platforms or software will be made available in order to allow States to test the compliance of their XML data to the IWXXM model before operational international exchange. This is to assure that the future internationally disseminated data are operationally usable.”*

2.9 This approach, i.e. the use of test systems and compliance testing, shall serve as a template for future ICAO activities where applicable. In such instances, e.g. in conjunction with detailed technical specifications for interfaces and exchange models, ICAO shall require the availability of reference implementations, test systems, and compliance testing provisions as one of the criteria applied by ICAO for referencing detailed technical specifications. CANSO believes this is a good example of a framework that should be applied to guarantee the maturity of detailed technical specifications as well as their interoperability across suppliers and regions.

### **3. POSSIBLE IMPACT ON ANNEXES**

3.1 ICAO should utilise, subject to the verification of meeting the essential requirements laid down in core SARPs, the work of standardising bodies, which have notified their compliance with the criteria outlined above, and reference these detailed technical specifications in ICAO Annexes, Procedures for Air Navigation Services, and corresponding documents.

### **4. NEED FOR ICAO COORDINATION**

4.1 The proposed provisions strongly support CANSO's vision of a globally harmonised, interoperable, and efficient air navigation system. The proposed provisions described in paragraph 2.6 also support the integration of emerging technologies such as drones and commercial space transportation into the global air transportation system.

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<sup>1</sup> World Trade Organization, *Uruguay Round Agreement: Agreement on Technical Barriers to Trade, Annex 3* [http://www.wto.org/english/docs\\_e/legal\\_e/17-tbt\\_e.htm](http://www.wto.org/english/docs_e/legal_e/17-tbt_e.htm) (accessed 05 January 2018)

<sup>2</sup> World Trade Organization, *Uruguay Round Agreement: Agreement on Technical Barriers to Trade, Annex 3, General Provisions Part B*, [http://www.wto.org/english/docs\\_e/legal\\_e/17-tbt\\_e.htm](http://www.wto.org/english/docs_e/legal_e/17-tbt_e.htm) (accessed 05 January 2018)

<sup>3</sup> ICAO, *Guidelines for the Implementation of OPMET Data Exchange using IWXXM*, <https://www.icao.int/APAC/Documents/edocs/Guidelines%20for%20IWXXM%20Implementation.pdf> (accessed 12 February 2018)

5. **RECOMMENDATIONS**

5.1 The Conference is invited to:

- a) note the paper;
- b) agree that standards-making organisations whose material is submitted for consideration by ICAO, shall comply with the proposed standardisation provisions set out in this paper (sections 2.2 – 2.7);
- c) task ICAO with establishing a task force including representation by regulatory agencies for the purpose of defining additional requirements for the verification and validation process applied by ICAO (as per ICAO Assembly Resolution A39-22) to recognise the work of other standards-making organisations in the development of ICAO material in accordance with the criteria set out in b) ; and
- d) encourage States and stakeholders to actively contribute to the development of detailed technical specifications.

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